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(54) FIXING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a fixing device that can shorten a warming-up time, has a simple the structure (control) of a heat generating body and can efficiently uniformize temperature distribution in the axial direction of a heating roller.

SOLUTION: Inside the hollow pipe type heating roller 10 with a heater 15 arranged inside, a high heat conductive roller 40 is arranged so that it may come into contact with the inner peripheral surface 17 of the roller 10 in the axial direction. The high heat conductive roller 40 is arranged near the downstream or near the upstream of a part 18 corresponding to the press contact position N with the pressure roller 20 in the rotating direction of the heating roller, and the heater 15 is arranged on the downstream side so as to be deviated from the rotational center of the heating roller.

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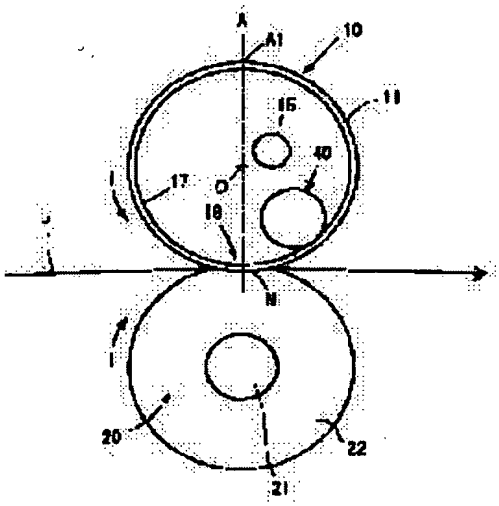

LEGAL STATUS

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* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] An anchorage device characterized by preparing in the interior a high temperature conduction member which contacts that inner skin in that direction of an axis inside said heating roller in an anchorage device equipped with a hollow pipe-like heating roller with which a heater has been arranged, and a pressurization roller by which the pressure welding is carried out to this heating roller.
[Claim 2] An anchorage device according to claim 1 characterized by said high temperature conduction member consisting of rollers.
[Claim 3] An anchorage device according to claim 1 or 2 with which said high temperature conduction member is characterized by contacting inner skin of a heating roller [near the lower stream of a river of a part corresponding to a pressure-welding location with a pressurization roller] about a hand of cut of a heating roller.
[Claim 4] An anchorage device according to claim 1 or 2 with which said high temperature conduction member is characterized by contacting inner skin of a heating roller [near the upstream of a part corresponding to a pressure-welding location with a pressurization roller] about a hand of cut of a heating roller.
[Claim 5] An anchorage device according to claim 1 or 2 characterized by preparing said at least two high temperature conduction members, for the one high temperature conduction member contacting inner skin of a heating roller about a hand of cut of a heating roller [near the lower stream of a river of a part corresponding to a pressure-welding location with a pressurization roller], and other one high temperature conduction member contacting inner skin of a heating roller [near the upstream of said part].
[Claim 6] It is an anchorage device given in any 1 term among claims 1-5 characterized by for said heater deflecting from the center of rotation of a heating roller, and arranging it about a hand of cut of a heating roller at the downstream of a part corresponding to a pressure-welding location with a pressurization roller.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] This invention relates to the anchorage device used for image formation equipments, such as a printer which can form a toner image in record material, such as a form, using electrophotographic technology, facsimile, and a copying machine.

[0002]
[Description of the Prior Art] Generally the image formation equipment which forms a toner image on record material (only henceforth a form), such as a form, using electrophotographic technology The photo conductor by which a rotation drive is carried out, and an exposure means to be exposed to this photo conductor and to form an electrostatic latent image in the surface, It has the anchorage device which said electrostatic latent image is developed, and it heats [anchorage device], passing the form by which the toner image was imprinted with a toner image, the development means to make, an imprint means to make a form imprint that toner image, and this imprint means, and fixes a toner image on a form.
[0003] The conventional common anchorage device is equipped with the pressurization roller by which the pressure welding is carried out to the heating roller heated and this heating roller, with both [these] rollers, is heated compressing the form to pass and carries out melting fixing of the toner image on a form on a form.
[0004] In such an anchorage device, although it is desired for the temperature distribution in the direction of an axis of both rollers, especially a heating roller to be uniform Since heat is taken by the form (and toner) in the contact section with the form in both rollers and heat is not taken by the form in the non-contact section because a form passes the pressure-welding section of both rollers, When fixing actuation is performed especially continuously, compared with the above-mentioned contact section, the temperature of the non-contact section rises remarkably, and there is a problem that it becomes difficult to maintain the temperature distribution in the direction of an axis of both rollers to homogeneity as a result.
[0005] Then, in order to solve such a problem, the following technology is already proposed conventionally.
(1) Prepare two or more heating elements with different exoergic distribution about the direction of an axis of a heating roller, and change the heating element to operate according to the temperature distribution of the heating roller at the time of fixing.
(2) Raise the thermal conductivity and the heat capacity in the direction of an axis by enlarging the cross section of a heating roller, and attain equalization of temperature distribution.
(3) As shown in drawing 7 , to the surface of a heating roller 1, contact the member 3 of high temperature conductivity and attain equalization of temperature distribution (JP,8-87191,A). In addition, in drawing 7 , 2 is a pressurization roller.
[0006]
[Problem(s) to be Solved by the Invention] There are the respectively following problems in the Prior art mentioned above.
(1) Prepare two or more heating elements with different exoergic distribution about the direction

of an axis of a heating roller, and with the technology of changing the heating element operated according to the temperature distribution of the heating roller at the time of fixing, the structure of a heating element portion and control are complicated and it is easy to cause an equipment failure.
(2) raise the thermal conductivity and the heat capacity in the direction of an axis by enlarging the cross section of a heating roller, and with the technology of attaining equalization of temperature distribution, since the heat capacity of a heating roller becomes large, warm-up time (build up time until a heating roller reaches predetermined temperature) becomes long, consider as a result, and the futility of energy increases.
(3) since the member 3 of high temperature conductivity is contacted and the high temperature conductivity member 3 touches to the surface of a heating roller 1 with the technology of attaining equalization of temperature distribution, to the surface of a heating roller 1 shown in drawing 7 , heat release other than heating roller 1 from the high temperature conductivity member 3 becomes large, can not necessarily attain equalization of the temperature distribution in the direction of an axis of a heating roller efficiently, and there is. [no]
[0007] It is easy (therefore, also in case of control), and the structure of warm-up time of a heating element portion is short, and ends [the above problems are solved,], and the purpose of this invention is to offer the anchorage device which can attain equalization of the temperature distribution in the direction of an axis of a heating roller efficiently.
[0008]
[Means for Solving the Problem] In order to attain the above-mentioned purpose, an anchorage device according to claim 1 is characterized by preparing in the interior a high temperature conduction member which contacts that inner skin in that direction of an axis inside said heating roller in an anchorage device equipped with a hollow pipe-like heating roller with which a heater has been arranged, and a pressurization roller by which the pressure welding is carried out to this heating roller. An anchorage device according to claim 2 is characterized by said high temperature conduction member consisting of rollers in an anchorage device according to claim 1. An anchorage device according to claim 3 is characterized by said high temperature conduction member contacting inner skin of a heating roller about a hand of cut of a heating roller [near the lower stream of a river of a part corresponding to a pressure-welding location with a pressurization roller] in an anchorage device according to claim 1 or 2. An anchorage device according to claim 4 is characterized by said high temperature conduction member contacting inner skin of a heating roller about a hand of cut of a heating roller [near the upstream of a part corresponding to a pressure-welding location with a pressurization roller] in an anchorage device according to claim 1 or 2. An anchorage device according to claim 5 is set to an anchorage device according to claim 1 or 2. Said at least two high temperature conduction members are prepared. The one high temperature conduction member It is characterized by contacting inner skin of a heating roller [near the lower stream of a river of a part corresponding to a pressure-welding location with a pressurization roller], and other one high temperature conduction member contacting inner skin of a heating roller [near the upstream of said part] about a hand of cut of a heating roller. It is characterized by for said heater deflecting [in / among claims 1-5 / an anchorage device given in any 1 term] an anchorage device according to claim 6 from the center of rotation of a heating roller, and being arranged about a hand of cut of a heating roller at the downstream of a part corresponding to a pressure-welding location with a pressurization roller.
[0009]
[Function and Effect] In the anchorage device which was equipped with the hollow pipe-like heating roller with which the heater has been arranged inside, and the pressurization roller by which the pressure welding is carried out to this heating roller according to the anchorage device according to claim 1 Since the high temperature conduction member which contacts the inner skin in the direction of an axis is prepared in the interior of said heating roller if the temperature distribution in the direction of an axis of a heating roller become an ununiformity, and it is going to become or, the heat of the elevated-temperature section in a heating roller will become possible [maintaining temperature distribution / in / to the low-temperature section / the

direction of an axis of a heating roller / to homogeneity by propagation and this through a high temperature conduction member]. And since what is necessary is just to prepare the high temperature conduction member which contacts the inner skin in the direction of an axis in the interior of a heating roller, it becomes unnecessary to prepare two or more heating elements, and the structure of a heating element portion and control are easy, and stop also being able to produce an equipment failure easily. Moreover, since it becomes unnecessary to enlarge the cross section of the heating roller itself, warm-up time is short and ends. Furthermore, since unlike what was shown in drawing 7 the high temperature conductivity member is prepared in the interior of a hollow pipe-like heating roller and the inner skin of a heating roller is contacted, heat release other than the heating roller from a high temperature conductivity member will decrease, and equalization of the temperature distribution in the direction of an axis of a heating roller will be efficiently attained as a result. That is, according to this anchorage device according to claim 1, it is simple for the structure of a heating element portion (therefore, also in case of control), and warm-up time is also short, it ends, and the effect that equalization of the temperature distribution in the direction of an axis of a heating roller can be attained efficiently is acquired. And although there was a difficulty that the surface of a heating roller 1 tends to deteriorate, and equipment is enlarged, in the conventional technology shown in drawing 7 since the high temperature conductivity member 3 touched the surface of a heating roller 1 Since according to this anchorage device according to claim 1 the high temperature conductivity member is prepared in the interior of a hollow pipe-like heating roller and contacts the inner skin of a heating roller, the surface of a heating roller does not deteriorate but the effect of not enlarging equipment, either is acquired. According to the anchorage device according to claim 2, in an anchorage device according to claim 1, since said high temperature conduction member consists of rollers, the touch area of a high temperature conductivity member and heating roller inner skin becomes large, and becomes possible [attaining equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently]. And since the high temperature conduction member consists of rollers, the effect that the rotation load of a heating roller does not increase compared with the case where a high temperature conduction member is constituted for example, from a slide contact member is also acquired. According to the anchorage device according to claim 3, in an anchorage device according to claim 1 or 2, since said high temperature conduction member contacts the inner skin of a heating roller about the hand of cut of a heating roller [near the lower stream of a river of the part corresponding to a pressure-welding location with a pressurization roller], it becomes possible [attaining equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently] so that it may explain below. Namely, as mentioned above, it sets to this kind of anchorage device. Since heat is taken by the form (and toner) in the contact section with the form in both rollers and heat is not taken by the form in the non-contact section because a form passes the pressure-welding section of a heating roller and a pressurization roller, The temperature distribution in the direction of an axis of a heating roller tend to become an ununiformity remarkably about the hand of cut of a heating roller [near the lower stream of a river of the part corresponding to a pressure-welding location with a pressurization roller]. According to this anchorage device according to claim 3, on the other hand, a high temperature conduction member The near lower stream of a river of the part corresponding to a pressure-welding location with a pressurization roller about the hand of cut of a heating roller Namely, since the temperature distribution in the direction of an axis of a heating roller tend to become an ununiformity remarkably and the inner skin of a heating roller is contacted in the big location of a temperature gradient The heat of the elevated-temperature section (part corresponding to the non-contact section with a form) in a heating roller will get across to the low-temperature section (part corresponding to the contact section with a form) efficiently through a high temperature conduction member. Therefore, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently. According to the anchorage device according to claim 4, it sets to an anchorage device according to claim 1 or 2. Since said high temperature conduction member contacts the inner skin of a heating roller about the hand of cut of a heating roller [near the upstream of the part

corresponding to a pressure-welding location with a pressurization roller] Just before a heating roller contacts a form, equalization of the temperature distribution in the direction of an axis will be attained, and the stable fixing condition will be acquired as a result. According to the anchorage device according to claim 5, it sets to an anchorage device according to claim 1 or 2. Said at least two high temperature conduction members are prepared. The one high temperature conduction member Since the inner skin of a heating roller is contacted [near the lower stream of a river of the part corresponding to a pressure-welding location with a pressurization roller] and other one high temperature conduction member contacts the inner skin of a heating roller [near the upstream of said part] about the hand of cut of a heating roller While equalization of the temperature distribution in the direction of an axis of a heating roller is efficiently attained in immediately after contact in a form by the one high temperature conduction member top The letter of fixing which equalization of the temperature distribution in the direction of an axis in front of contact in a form will be attained, and was further stabilized as a result by other one high temperature conduction member ** will be obtained. Among claims 1-5, in an anchorage device given in any 1 term, since said heater is deflecting from the center of rotation of a heating roller and is arranged about the hand of cut of a heating roller at the downstream of the part corresponding to a pressure-welding location with a pressurization roller, according to the anchorage device according to claim 6, it becomes possible [attaining equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently] so that it may explain below. Namely, as mentioned above, it sets to this kind of anchorage device. Since heat is taken by the form (and toner) in the contact section with the form in both rollers and heat is not taken by the form in the non-contact section because a form passes the pressure-welding section of a heating roller and a pressurization roller, The temperature distribution in the direction of an axis of a heating roller tend to become an ununiformity about the hand of cut of a heating roller in the downstream of the part corresponding to a pressure-welding location with a pressurization roller. On the other hand, since according to this anchorage device according to claim 6 the heater is deflecting from the center of rotation of a heating roller and the temperature of a contact part with the form in the downstream of an axis of the part corresponding to a pressure-welding location with a pressurization roller, i.e., the direction of a heating roller, is arranged about the hand of cut of a heating roller in the low location, the heat supply from the heater to that low-temperature section will be made efficiently. Therefore, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently. It follows, and this configuration according to claim 6 becomes effective especially, when it combines with the configuration of above-mentioned claim 3.

[0010]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

Partial abbreviation III-III end view [in / the outline front view and drawing 2 which show the important section of the gestalt of operation of the 1st of the anchorage device which <gestalt of the 1st operation> drawing 1 requires for this invention, and / in drawing 3 / drawing 2], and drawing 4 are the expanded sectional views of a heating roller. [a positive cross section]

[0011] As shown in these drawings, this anchorage device is equipped with the pressurization roller 20 by which the pressure welding is carried out to a heating roller 10 and this heating roller 10.

[0012] As a heating roller 10 is shown in drawing 4 , it has the metal pipe 11, the elastic layer 12 covered by the surface, and surface (for example, PFA layer) 12a further covered by the surface, and as shown in drawing 1 and drawing 2 , the both ends of a pipe 11 are supported by the frame 30 of an anchorage device pivotable by the bearing 13 and the supporter material 14. The heater 15 which is an exoergic means is inserted in the interior of a pipe 11, and a heating roller 10 is heated at this heater 15. The gear 16 is being fixed to that end and the rotation drive of the heating roller 10 is carried out by having geared with the gear of the drive which has the motor which this gear 16 does not illustrate.

[0013] Moreover, the high temperature conduction member 40 which contacts the inner skin 17

in the direction of an axis (it sets to drawing 2 and is a longitudinal direction) is formed in the interior of a heating roller 10. The high temperature conduction member 40 can be constituted from a material with the high thermal conductivity of aluminum, copper, etc., and the roller which consists of aluminum constitutes it from the gestalt of this operation. Furthermore, the gestalt of this operation has covered the surface (contact surface with the inner skin 17 of a heating roller 10) of the high temperature conduction roller 40 in the elastic layer 41 of high temperature conductivity, in order to make contact to the inner skin 17 of a heating roller 10 certainly and smooth and to extend a touch area further, as shown in drawing 4 . As shown in drawing 2 , the shaft 42 of those both ends is supported by the bearing 43 pivotable, and a pressure welding is carried out to the inner skin 17 of the heating roller 10 by this bearing 43 being energized towards the inner skin 17 of a heating roller 10 with the spring 44, and it follows and rotates the high temperature conduction roller 40 to a heating roller 10. As shown in drawing 3 , the high temperature conduction roller 40 touches the inner skin 17 of a heating roller 10 [near the lower stream of a river of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20] about the hand of cut (it sets to drawing 3 and is a counterclockwise rotation) of a heating roller 10.

[0014] As shown in drawing 3 , the heater 15 is deflected from the center of rotation O of a heating roller 10, and is arranged about the hand of cut of a heating roller 10 at the downstream of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20. In addition, as shown in drawing 3 , when the heating roller 10 is carried out for 2 minutes by the center of rotation O and the segment (normal of the pressure-welding section N) A which passes along the pressure-welding section (pressure-welding location) N, The field (it sets to drawing 3 and is on the right-hand side of Segment A) which reaches the division location A1 located from the pressure-welding section N along the hand of cut of a heating roller 10 in the opposition was called downstream, and the field (it sets to drawing 3 and is on the left-hand side of Segment A) from the division location A1 to the pressure-welding section N is called upstream. In drawing 1 and drawing 2 , 15a and 15a are supporter material which is supporting the heater 15 on the frame 30.

[0015] It has the shaft 21 and the elastic body 22 with which the surroundings of this shaft 21 were equipped, the both ends of a shaft 21 are supported by the bearing 23 pivotable, and the pressure welding of the pressurization roller 20 is carried out to the heating roller 10 by this bearing 23 being energized towards a heating roller 10 with the pressurization spring 24, and it is followed and rotated to a heating roller 10.

[0016] A toner image is fixed on Form P by heating them, the above anchorage devices passing the form P by which the toner image was imprinted with the imprint means which is not illustrated in the pressure-welding section N of a heating roller 10 and the pressurization roller 20 in the direction shown in drawing 3 by the arrow head. In addition, in drawing 1 , P has shown an example of the passage range of a form (copy paper field).

[0017] According to the above anchorage devices, the following operation effects are acquired. (a) The hollow pipe-like heating roller 10 with which the heater 15 has been arranged inside, Since it has the pressurization roller 20 by which the pressure welding is carried out to this heating roller 10 and the high temperature conduction member 40 which contacts that inner skin 17 in that direction of an axis is formed in the interior of a heating roller 10 if the temperature distribution in the direction of an axis of a heating roller 10 become an ununiformity, and it is going to become or -- As the heat of the elevated-temperature section (for example, part 10a which is equivalent to the both ends of the **** field P in drawing 1 (refer to drawing 2)) in a heating roller 10 shows drawing 2 by the arrow head a through the high temperature conduction member 40, to the low-temperature section (for example, part 10b which is equivalent to the **** field P in drawing 1 (refer to drawing 2)) Propagation, It becomes possible to maintain the temperature distribution in the direction of an axis of a heating roller 10 to homogeneity by this. And since what is necessary is just to form the high temperature conduction member 40 which contacts the inner skin 17 in the direction of an axis in the interior of a heating roller 10, it becomes unnecessary to prepare plurality for a heating element 15, and the structure of heating element 14 portion and control are easy, and stop also being able to produce an equipment

failure easily. Moreover, since the necessity of enlarging the cross section of heating roller 10 the very thing (for example, a pipe 11 being made thick) is also lost, warm-up time is short and ends. Furthermore, since the high temperature conductivity member 40 is formed in the interior of the hollow pipe-like heating roller 10 unlike what was shown in drawing 7 and the inner skin 17 of a heating roller 10 is contacted, heat release other than heating roller 10 from the high temperature conductivity member 40 decreases. That is, the heat of the high temperature conductivity member 40 will get across to a heating roller 10 through the building envelope of a heating roller 10 in addition to the contact section with the inner skin 17 of a heating roller 10. Therefore, equalization of the temperature distribution in the direction of an axis of the heating roller 10 will be attained efficiently. That is, according to this anchorage device, it is simple for the structure of a heating element portion (therefore, also in case of control), and warm-up time is also short, it ends, and the effect that equalization of the temperature distribution in the direction of an axis of the heating roller 10 can be attained efficiently is acquired. And although there was a difficulty that the surface of a heating roller 1 tends to deteriorate, and equipment is enlarged, in the conventional technology shown in drawing 7 since the high temperature conductivity member 3 touched the surface of a heating roller 1 Since according to the anchorage device of the gestalt of this operation the high temperature conductivity member 40 is formed in the interior of the hollow pipe-like heating roller 10 and contacts the inner skin 17 of a heating roller 10, the surface of a heating roller 10 does not deteriorate but the effect of not enlarging equipment, either is acquired.

(b) Since the high temperature conduction member 40 consists of rollers, the touch area of the high temperature conductivity member 40 and the heating roller inner skin 17 becomes large, and becomes possible [attaining equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently]. And since the high temperature conduction member 40 consists of rollers, the effect that the rotation load of a heating roller 10 does not increase compared with the case where the high temperature conduction member 40 is constituted for example, from a slide contact member is also acquired. Furthermore, with the gestalt of this operation, since the surface (contact surface with the inner skin 17 of a heating roller 10) of the high temperature conduction roller 40 is covered with the elastic layer 41 of high temperature conductivity as shown in drawing 4 , while contact to the inner skin 17 of a heating roller 10 becomes certainly and smooth, a touch area also increases further and becomes possible [attaining equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently].

(c) Since the high temperature conduction member 40 contacts the inner skin 17 of a heating roller 10 about the hand of cut of a heating roller 10 [near the lower stream of a river of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20], it becomes possible [attaining equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently] so that it may explain below. Namely, it is that Form P passes the pressure-welding section N of a heating roller 10 and the pressurization roller 20 in this kind of anchorage device. Since heat is taken by the form (and toner) in the contact section with the form P in both the rollers 10 and 20 and heat is not taken by Form P in the non-contact section, Supposing it does not adopt any means, either, the temperature distribution in the direction of an axis of a heating roller 10 will tend to become an ununiformity remarkably about the hand of cut of a heating roller 10 [near the lower stream of a river of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20]. According to the anchorage device of the gestalt of this operation, on the other hand, the high temperature conduction member 40 The near lower stream of a river of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20 about the hand of cut of a heating roller 10 Namely, since the inner skin 17 of a heating roller 10 is contacted in the location where the temperature distribution in the direction of an axis of a heating roller 10 tend to become an ununiformity remarkably, and a temperature gradient tends to become large The heat of elevated-temperature section (part corresponding to the non-contact section with form) 10a in a heating roller 10 will get across to low-temperature section (part corresponding to the contact section with form) 10b efficiently through the high

temperature conduction member 40. Therefore, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently.

(d) Since the heater 15 is arrange in the location where it is deflect from the center of rotation O of a heating roller 10 , and the downstream of the part 18 corresponding to the pressure welding location N with the pressurization roller 20 , i.e. , the temperature of a contact part with the form [in / as mention above / the direction of an axis of the heating roller 10] P , becomes low about the hand of cut of a heating roller 10 , the heat supply from the heater 15 to the low-temperature section will be make efficiently . Therefore, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently. And as mentioned above, since the high temperature conduction member 40 contacts the inner skin 17 of a heating roller 10 about the hand of cut of a heating roller 10 [near the lower stream of a river of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20], it becomes possible [attaining equalization of the temperature distribution in the direction of an axis of the heating roller 10 much more efficiently].

[0018] <Gestalt of the 2nd operation> drawing 5 is the outline cross section (drawing equivalent to the III-III end face in drawing 2) showing the important section of the gestalt of operation of the 2nd of the anchorage device concerning this invention. In drawing 5 , the same sign is given to the same portion as a gestalt thru/or the corresponding portion of implementation of the above 1st. The point that the gestalt of this operation differs from the gestalt of implementation of the above 1st has the high temperature conduction member 40 in the point that it is [/ near the upstream of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20] in contact with the inner skin 17 of a heating roller 10, about the hand of cut of a heating roller 10, and there is no change in other points. The same effect as the above (a) by the gestalt of the 1st operation, (b), and (d) is acquired also according to the gestalt of this operation. Moreover, since the high temperature conduction member 40 touches the inner skin 17 of a heating roller 10 about the hand of cut of a heating roller 10 [near the upstream of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20], just before a heating roller 10 contacts Form P, equalization of the temperature distribution in the direction of an axis will be attained, and the stable fixing condition will be acquired as a result.

[0019] <Gestalt of the 3rd operation> drawing 6 is the outline cross section (drawing equivalent to the III-III end face in drawing 2) showing the important section of the gestalt of operation of the 3rd of the anchorage device concerning this invention. In drawing 6 , the same sign is given to the same portion as a gestalt thru/or the corresponding portion of implementation of the above 1st. The point that the gestalt of this operation differs from the gestalt of implementation of the above 1st Two high temperature conduction members (40 40') are prepared. The one high temperature conduction member 40 The inner skin 17 of a heating roller 10 is contacted about the hand of cut of a heating roller 10 [near the lower stream of a river of the part 18 corresponding to the pressure-welding location N with the pressurization roller 20]. Other one high temperature conduction member 40' is in the point of contacting the inner skin 17 of a heating roller 10 [near the upstream of said part 18], and there is no change in other points. According to the gestalt of this operation, the operation effect by the gestalt of the above 1st and the 2nd implementation will be acquired by coincidence.

[0020] As mentioned above, although the gestalt of operation of this invention was explained, this invention is not limited to the gestalt of the above-mentioned operation, and deformation implementation is possible for it suitably within the limits of the summary of this invention. For example, invention of those other than ** claim 2 may constitute the high temperature conduction roller 40 from the member which ****s to the inner skin 17 of a heating roller 10 instead of a roller.

** Only when you make it fixed to the small size paper (small form of the above-mentioned **** field P (width of face)) in which an attachment-and-detachment device is established to the high temperature conduction member 40, and especially temperature distribution tend to become an

ununiformity The high temperature conduction member 40 is made to contact the inner skin 17 of a heating roller 10. In being other (large size paper with high operating frequency (for example, A4 size paper)) By not making it contact, the warm-up time of a making [you / fixed to a form with high operating frequency] case can be shortened remarkably.
** Two or more high temperature conduction members 40 may be formed.
[0021]
[Effect of the Invention] By any anchorage device according to claim 1 to 6, it is simple for the structure of a heating element portion (therefore, also in case of control), and warm-up time is also short, it ends, and the effect that equalization of the temperature distribution in the direction of an axis of a heating roller can be attained efficiently is acquired. And the surface of a heating roller does not deteriorate but the effect of not enlarging equipment, either is also acquired. Furthermore, while becoming possible to attain equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently according to the anchorage device according to claim 2, the effect that the rotation load of a heating roller does not increase is acquired. According to the anchorage device according to claim 3, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently. According to the anchorage device according to claim 4, the stable fixing condition will be acquired. According to the anchorage device according to claim 5, the fixing condition stabilized further will be acquired. According to the anchorage device according to claim 6, it becomes possible to attain equalization of the temperature distribution in the direction of an axis of a heating roller much more efficiently.
[0022]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] Outline front view showing the important section of the gestalt of operation of the 1st of the anchorage device concerning this invention.
[Drawing 2] A positive cross section same as the above.
[Drawing 3] Partial abbreviation III-III end view in drawing 2 .
[Drawing 4] The expanded sectional view of a heating roller.
[Drawing 5] The outline cross section showing the important section of the gestalt of operation of the 2nd of the anchorage device concerning this invention (drawing equivalent to the III-III end face in drawing 2).
[Drawing 6] The outline cross section showing the important section of the gestalt of operation of the 3rd of the anchorage device concerning this invention (drawing equivalent to the III-III end face in drawing 2).
[Drawing 7] Explanatory drawing of the conventional technology.
[Description of Notations]
10 Heating Roller
15 Heater
17 Inner Skin
20 Pressurization Roller
40 High Temperature Conduction Roller (High Temperature Conduction Member)
N Pressure-welding location

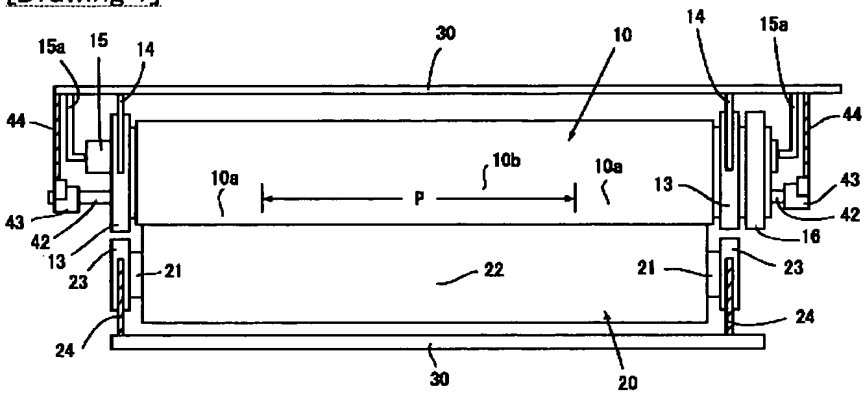
[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

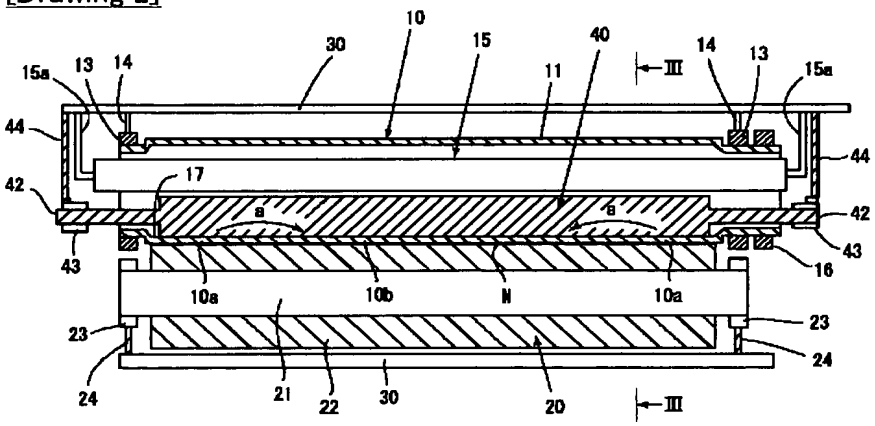
DRAWINGS

[Drawing 1]



82857-01

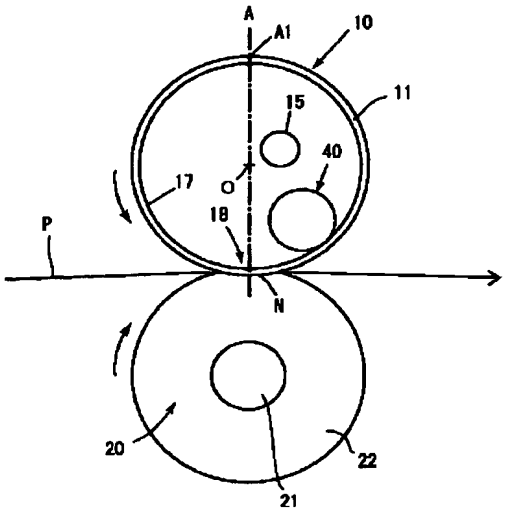
[Drawing 2]



82857-02

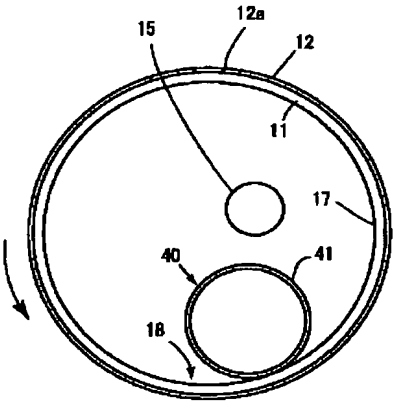
[Drawing 3]

82857-03



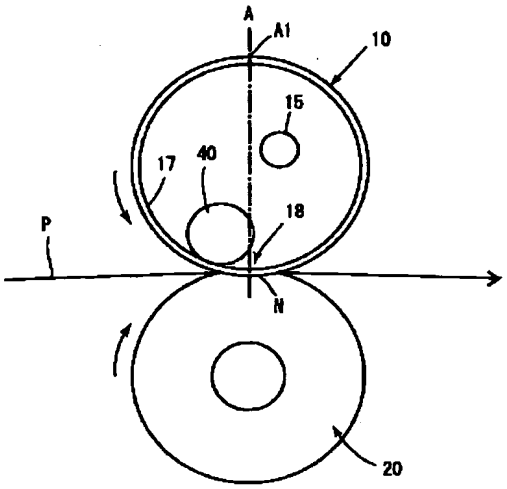
[Drawing 4]

82857-04



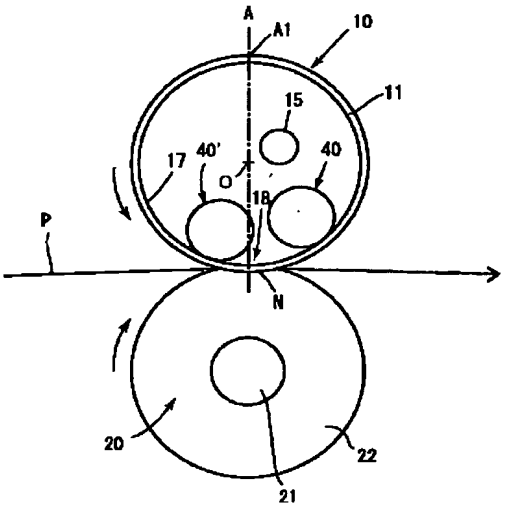
[Drawing 5]

82857-05



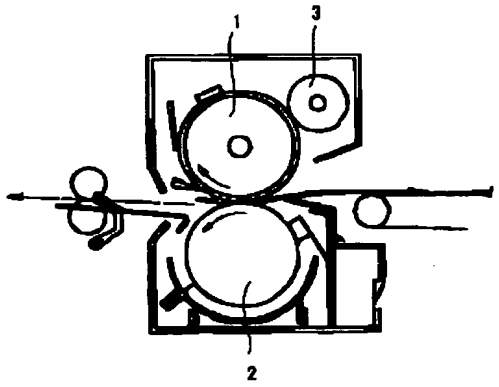
[Drawing 6]

82857-06



[Drawing 7]

82857-07



[Translation done.]

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Ｆ１６Ｃ　13/00		Ｆ１６Ｃ　13/00	Ｃ	３Ｊ１０３
			Ｅ	３Ｋ０５８
Ｈ０５Ｂ　3/00	３３５	Ｈ０５Ｂ　3/00	３３５	

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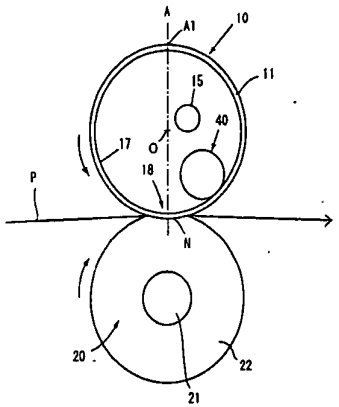
Ｆターム(参考)　2Ｈ033 ＡＡ03 ＡＡ30 ＢＢ03 ＢＢ13 ＢＢ18 ＢＢ21 ＢＢ28 ＢＢ34
3Ｊ103 ＡＡ81 ＢＡ03 ＢＡ17 ＦＡ01 ＦＡ20 ＧＡ02 ＧＡ57 ＧＡ58 ＧＡ60
3Ｋ058 ＡＡ86 ＢＡ18 ＤＡ01

(54)【発明の名称】　定着装置

82857-03

(57)【要約】
【課題】　発熱体部分の構造（制御）が簡単でウォームアップ時間も短くて済み、効率的に加熱ローラの軸線方向における温度分布の均一化を図る。
【解決手段】　内部にヒータ１５が配置された中空パイプ状の加熱ローラ１０の内部に、その軸線方向においてその内周面１７と接触する高熱伝導ローラ４０を設ける。高熱伝導ローラ４０は、加熱ローラの回転方向に関し、加圧ローラ２０との圧接位置Ｎに対応する部位１８の下流近傍または上流近傍に設け、ヒータ１５は、加熱ローラの回転中心から偏倚させて下流側に配置する。



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【特許請求の範囲】
【請求項１】　内部にヒータが配置された中空パイプ状の加熱ローラと、この加熱ローラに圧接されている加圧ローラとを備えた定着装置において、
前記加熱ローラの内部に、その軸線方向においてその内周面と接触する高熱伝導部材が設けられていることを特徴とする定着装置。
【請求項２】　前記高熱伝導部材がローラで構成されていることを特徴とする請求項１記載の定着装置。
【請求項３】　前記高熱伝導部材が、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流近傍において加熱ローラの内周面と接触することを特徴とする請求項１または２記載の定着装置。
【請求項４】　前記高熱伝導部材が、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の上流近傍において加熱ローラの内周面と接触することを特徴とする請求項１または２記載の定着装置。
【請求項５】　前記高熱伝導部材が、少なくとも２つ設けられていて、その１つの高熱伝導部材が、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流近傍において加熱ローラの内周面と接触し、他の１つの高熱伝導部材が、前記部位の上流近傍において加熱ローラの内周面と接触することを特徴とする請求項１または２記載の定着装置。
【請求項６】　前記ヒータが、加熱ローラの回転中心から偏倚しており、かつ、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流側に配置されていることを特徴とする請求項１～５のうちいずれか１項に記載の定着装置。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、電子写真技術を用いて用紙等の記録材にトナー画像を形成することのできるプリンター、ファクシミリ、複写機等の画像形成装置に用いられる定着装置に関するものである。
【０００２】
【従来の技術】一般に、電子写真技術を用いて用紙等の記録材（以下単に用紙という）上にトナー画像を形成する画像形成装置は、回転駆動される感光体と、この感光体に露光して表面に静電潜像を形成する露光手段と、前記静電潜像を現像してトナー画像となす現像手段と、そのトナー画像を用紙に転写させる転写手段と、この転写手段によりトナー画像が転写された用紙を通過させつつ加熱して用紙上にトナー画像を定着させる定着装置とを有している。
【０００３】従来の一般的な定着装置は、加熱される加熱ローラとこの加熱ローラに圧接されている加圧ローラとを備えており、これら両ローラによって、通過する用紙を挟圧しつつ加熱し、用紙上のトナー画像を用紙上に溶融定着させるようになっている。

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【０００４】このような定着装置においては、両ローラ、特に加熱ローラの軸線方向における温度分布が均一であることが望まれるが、両ローラの圧接部を用紙が通過することで、両ローラにおける用紙との接触部においては用紙（およびトナー）に熱が奪われ、非接触部においては用紙に熱が奪われないため、特に、連続して定着動作が行われると、上記接触部に比べて非接触部の温度が著しく上昇し、結果として、両ローラの軸線方向における温度分布を均一に維持することが困難になるという問題がある。
【０００５】そこで、このような問題を解決するために、従来、次のような技術がすでに提案されている。
（１）加熱ローラの軸線方向に関して異なる発熱分布をもつ発熱体を複数用意し、定着時の加熱ローラの温度分布に応じて、作動させる発熱体を変更する。
（２）加熱ローラの断面積を大きくすることで軸線方向における熱伝導性および熱容量を高め、温度分布の均一化を図る。
（３）図７に示すように、加熱ローラ１の表面に対し、高熱伝導性の部材３を接触させて、温度分布の均一化を図る（特開平８－８７１９１号）。なお、図７において、２は加圧ローラである。
【０００６】
【発明が解決しようとする課題】上述した従来の技術には、それぞれ次のような問題がある。
（１）加熱ローラの軸線方向に関して異なる発熱分布をもつ発熱体を複数用意し、定着時の加熱ローラの温度分布に応じて作動させる発熱体を変更する技術では、発熱体部分の構造や制御が複雑化し、機器の故障を招きやすい。
（２）加熱ローラの断面積を大きくすることで軸線方向における熱伝導性および熱容量を高め、温度分布の均一化を図る技術では、加熱ローラの熱容量が大きくなるため、ウォームアップ時間（加熱ローラが所定温度に達するまでの立ち上がり時間）が長くなり、結果としてエネルギーの無駄が多くなる。
（３）図７に示した、加熱ローラ１の表面に対し、高熱伝導性の部材３を接触させて、温度分布の均一化を図る技術では、加熱ローラ１の表面に対して高熱伝導性部材３が接触しているので、高熱伝導性部材３からの加熱ローラ１以外への放熱量が大きくなり、必ずしも効率的に加熱ローラの軸線方向における温度分布の均一化を図ることができない。
【０００７】この発明の目的は、以上のような問題を解決し、発熱体部分の構造が（したがって制御も）簡単でウォームアップ時間も短くて済み、効率的に加熱ローラの軸線方向における温度分布の均一化を図ることができる定着装置を提供することにある。
【０００８】
【課題を解決するための手段】上記目的を達成するため

に請求項１記載の定着装置は、内部にヒータが配置された中空パイプ状の加熱ローラと、この加熱ローラに圧接されている加圧ローラとを備えた定着装置において、前記加熱ローラの内部に、その軸線方向においてその内周面と接触する高熱伝導部材が設けられていることを特徴とする。請求項２記載の定着装置は、請求項１記載の定着装置において、前記高熱伝導部材がローラで構成されていることを特徴とする。請求項３記載の定着装置は、請求項１または２記載の定着装置において、前記高熱伝導部材が、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流近傍において加熱ローラの内周面と接触することを特徴とする。請求項４記載の定着装置は、請求項１または２記載の定着装置において、前記高熱伝導部材が、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の上流近傍において加熱ローラの内周面と接触することを特徴とする。請求項５記載の定着装置は、請求項１または２記載の定着装置において、前記高熱伝導部材が、少なくとも２つ設けられていて、その１つの高熱伝導部材が、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流近傍において加熱ローラの内周面と接触し、他の１つの高熱伝導部材が、前記部位の上流近傍において加熱ローラの内周面と接触することを特徴とする。請求項６記載の定着装置は、請求項１～５のうちいずれか１項に記載の定着装置において、前記ヒータが、加熱ローラの回転中心から偏倚しており、かつ、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流側に配置されていることを特徴とする。

【０００９】

【作用効果】請求項１記載の定着装置によれば、内部にヒータが配置された中空パイプ状の加熱ローラと、この加熱ローラに圧接されている加圧ローラとを備えた定着装置において、前記加熱ローラの内部に、その軸線方向においてその内周面と接触する高熱伝導部材が設けられているので、加熱ローラの軸線方向における温度分布が不均一になると（あるいはなろうとすると）、加熱ローラにおける高温部の熱が高熱伝導部材を介して低温部へと伝わり、これによって、加熱ローラの軸線方向における温度分布を均一に維持することが可能となる。そして、加熱ローラの内部に、その軸線方向においてその内周面と接触する高熱伝導部材を設けるだけでよいので、複数の発熱体を用意する必要がなくなり、発熱体部分の構造および制御が簡単で、機器の故障も生じ難くなる。また、加熱ローラ自体の断面積を大きくする必要もなくなるので、ウォームアップ時間が短くて済む。さらに、図７に示したものと異なり、高熱伝導性部材は中空パイプ状の加熱ローラの内部に設けられていて加熱ローラの内周面と接触するので、高熱伝導性部材からの加熱ローラ以外への放熱量が少なくなり、結果として効率的に加熱ローラの軸線方向における温度分布の均一化が図られることとなる。すなわち、この請求項１記載の定着装置によれば、発熱体部分の構造が（したがって制御も）簡単でウォームアップ時間も短くて済み、効率的に加熱ローラの軸線方向における温度分布の均一化を図ることができるという効果が得られる。しかも、図７に示した従来技術においては、高熱伝導性部材３が加熱ローラ１の表面に接触しているので、加熱ローラ１の表面が劣化しやすく、また、装置が大型化するという難点があったが、この請求項１記載の定着装置によれば、高熱伝導性部材が、中空パイプ状の加熱ローラの内部に設けられていて加熱ローラの内周面と接触するので、加熱ローラの表面が劣化せず、装置も大型化しないという効果が得られる。請求項２記載の定着装置によれば、請求項１記載の定着装置において、前記高熱伝導部材がローラで構成されているので、高熱伝導性部材と加熱ローラ内周面との接触面積が広くなり、一層効率的に加熱ローラの軸線方向における温度分布の均一化を図ることが可能となる。しかも、高熱伝導部材がローラで構成されているので、高熱伝導部材を例えば摺接部材で構成した場合に比べて加熱ローラの回転負荷が増大しないという効果も得られる。請求項３記載の定着装置によれば、請求項１または２記載の定着装置において、前記高熱伝導部材が、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流近傍において加熱ローラの内周面と接触するので、以下に説明するように、一層効率的に加熱ローラの軸線方向における温度分布の均一化を図ることが可能となる。すなわち、前述したように、この種の定着装置においては、加熱ローラと加圧ローラとの圧接部を用紙が通過することで、両ローラにおける用紙との接触部においては用紙（およびトナー）に熱が奪われ、非接触部においては用紙に熱が奪われないため、加熱ローラの軸線方向における温度分布は、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流近傍において著しく不均一になりやすい。これに対し、この請求項３記載の定着装置によれば、高熱伝導部材が、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流近傍、すなわち加熱ローラの軸線方向における温度分布が著しく不均一になりやすく、温度差の大きな位置において加熱ローラの内周面と接触するので、加熱ローラにおける高温部（用紙との非接触部に対応する部位）の熱が高熱伝導部材を介して低温部（用紙との接触部に対応する部位）へ効率的に伝わることとなる。したがって、一層効率的に加熱ローラの軸線方向における温度分布の均一化を図ることが可能となる。請求項４記載の定着装置によれば、請求項１または２記載の定着装置において、前記高熱伝導部材が、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の上流近傍において加熱ローラの内周面と接触するので、加熱ローラが用紙と接触する直前において、その軸線方向における温度分布の均一化が図られることとなり、結果として、安定した定着状態が得られることとなる。請求項５記載の定着装置によれば、請求項１または２記載の定着装置において、前記高熱伝導部材が、少なくとも２つ設けられていて、その１つの高熱伝導部材が、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流近傍において加熱ローラの内周面と接触し、他の１つの高熱伝導部材が、前記部位の上流近傍において加熱ローラの内周面と接触するので、１つの高熱伝導部材上によって、用紙との接触直後において効率的に加熱ローラの軸線方向における温度分布の均一化が図られるとともに、他の１つの高熱伝導部材によって、用紙との接触直前における軸線方向における温度分布の均一化が図られることとなり、結果として、より一層安定した定着状態が得られることとなる。請求項６記載の定着装置によれば、請求項１～５のうちいずれか１項に記載の定着装置において、前記ヒータが、加熱ローラの回転中心から偏倚しており、かつ、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流側に配置されているので、以下に説明するように、一層効率的に加熱ローラの軸線方向における温度分布の均一化を図ることが可能となる。すなわち、前述したように、この種の定着装置においては、加熱ローラと加圧ローラとの圧接部を用紙が通過することで、両ローラにおける用紙との接触部においては用紙（およびトナー）に熱が奪われ、非接触部においては用紙に熱が奪われないため、加熱ローラの軸線方向における温度分布は、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流側において不均一になりやすい。これに対し、この請求項６記載の定着装置によれば、ヒータが、加熱ローラの回転中心から偏倚しており、かつ、加熱ローラの回転方向に関し、加圧ローラとの圧接位置に対応する部位の下流側すなわち加熱ローラの軸線方向における用紙との接触部位の温度が低い位置に配置されているので、その低温部に対するヒータからの熱供給が効率的になされることとなる。したがって、一層効率的に加熱ローラの軸線方向における温度分布の均一化を図ることが可能となる。したがって、また、この請求項６記載の構成は、上記請求項３の構成と組み合わせた場合に特に有効になる。

【００１０】

【発明の実施の形態】以下、本発明の実施の形態について図面を参照して説明する。

＜第１の実施の形態＞図１は本発明に係る定着装置の第１の実施の形態の要部を示す概略正面図、図２は正断面図、図３は図２における部分省略ＩＩＩ－ＩＩＩ端面図、図４は加熱ローラの拡大断面図である。

【００１１】これらの図に示すように、この定着装置は、加熱ローラ１０とこの加熱ローラ１０に圧接されている加圧ローラ２０とを備えている。

【００１２】加熱ローラ１０は、図４に示すように、金属製のパイプ１１と、その表面に被覆された弾性層１２と、さらにその表面に被覆された表層（例えばＰＦＡ層）１２ａとを備えており、図１，図２に示すように、パイプ１１の両端部が軸受け１３および支持部材１４によって、定着装置のフレーム３０に回転可能に支持されている。パイプ１１の内部には、発熱手段であるヒータ１５が挿通されており、このヒータ１５によって加熱ローラ１０が加熱される。加熱ローラ１０は、その一端にギア１６が固定されており、このギア１６が図示しないモータを有する駆動機構のギアに噛み合っていることによって回転駆動される。

【００１３】また、加熱ローラ１０の内部には、その軸線方向（図２において左右方向）においてその内周面１７と接触する高熱伝導部材４０が設けられている。高熱伝導部材４０は、アルミニウムや銅等の熱伝導率の高い材料で構成することができ、この実施の形態では例えばアルミニウムからなるローラで構成してある。さらに、この実施の形態では、図４に示すように、加熱ローラ１０の内周面１７との接触を確実かつ円滑にし、さらに接触面積を広げるために、高熱伝導ローラ４０の表面（加熱ローラ１０の内周面１７との接触面）を、高熱伝導性の弾性層４１で被覆してある。図２に示すように、高熱伝導ローラ４０は、その両端の軸４２が軸受け４３によって回転可能に支持されており、この軸受け４３が、バネ４４により加熱ローラ１０の内周面１７へ向けて付勢されていることで加熱ローラ１０の内周面１７に圧接され、加熱ローラ１０に従動して回転する。図３に示すように、高熱伝導ローラ４０は、加熱ローラ１０の回転方向（図３において反時計方向）に関し、加圧ローラ２０との圧接位置Ｎに対応する部位１８の下流近傍において加熱ローラ１０の内周面１７と接触している。

【００１４】図３に示すように、ヒータ１５は、加熱ローラ１０の回転中心Ｏから偏倚しており、かつ、加熱ローラ１０の回転方向に関し、加圧ローラ２０との圧接位置Ｎに対応する部位１８の下流側に配置されている。なお、図３に示すように、回転中心Ｏと圧接部（圧接位置）Ｎとを通る線分（圧接部Ｎの法線）Ａで加熱ローラ１０を２分したとき、加熱ローラ１０の回転方向に沿って圧接部Ｎからその反対位置にある分割位置Ａ１に至る領域（図３において線分Ａの右側）を下流側といい、分割位置Ａ１から圧接部Ｎに至る領域（図３において線分Ａの左側）を上流側といっている。図１，図２において、１５ａ，１５ａは、ヒータ１５をフレーム３０に支持している支持部材である。

【００１５】加圧ローラ２０は、軸２１と、この軸２１の回りに装着された弾性体２２とを有しており、軸２１の両端部が軸受け２３によって回転可能に支持されており、この軸受け２３が、加圧バネ２４により加熱ローラ１０へ向けて付勢されていることで加熱ローラ１０に圧接され、加熱ローラ１０に従動して回転する。

【００１６】以上のような定着装置は、加熱ローラ１０と加圧ローラ２０との圧接部Ｎに、図示しない転写手段でトナー画像が転写された用紙Ｐを図３に矢印で示す方向に通過させつつ加熱することで用紙Ｐ上にトナー画像を定着させる。なお、図１において、用紙の通過範囲（通紙領域）の一例をＰで示してある。

【００１７】以上のような定着装置によれば、次のような作用効果が得られる。

（ａ）内部にヒータ１５が配置された中空パイプ状の加熱ローラ１０と、この加熱ローラ１０に圧接されている加圧ローラ２０とを備え、加熱ローラ１０の内部に、その軸線方向においてその内周面１７と接触する高熱伝導部材４０が設けられているので、加熱ローラ１０の軸線方向における温度分布が不均一になると（あるいはなろうとすると）、加熱ローラ１０における高温部（例えば図１において通紙領域Ｐの両端部に相当する部位１０ａ（図２参照））の熱が高熱伝導部材４０を介して図２に矢印ａで示すように低温部（例えば図１において通紙領域Ｐに相当する部位１０ｂ（図２参照））へと伝わり、これによって、加熱ローラ１０の軸線方向における温度分布を均一に維持することが可能となる。そして、加熱ローラ１０の内部に、その軸線方向においてその内周面１７と接触する高熱伝導部材４０を設けるだけでよいので、発熱体１５を複数を用意する必要がなくなり、発熱体１４部分の構造および制御が簡単で、機器の故障も生じ難くなる。また、加熱ローラ１０自体の断面積を大きくする（例えばパイプ１１を肉厚にする）必要もなくなるので、ウォームアップ時間が短くて済む。さらに、図７に示したものと異なり、高熱伝導性部材４０は中空パイプ状の加熱ローラ１０の内部に設けられていて加熱ローラ１０の内周面１７と接触するので、高熱伝導性部材４０からの加熱ローラ１０以外への放熱量が少なくなる。すなわち、高熱伝導性部材４０の熱は、加熱ローラ１０の内周面１７との接触部以外においては加熱ローラ１０の内部空間を経て加熱ローラ１０へ伝わることとなる。したがって、効率的に加熱ローラ１０の軸線方向における温度分布の均一化が図られることとなる。すなわち、この定着装置によれば、発熱体部分の構造が（したがって制御も）簡単でウォームアップ時間も短くて済み、効率的に加熱ローラ１０の軸線方向における温度分布の均一化を図ることができるという効果が得られる。しかも、図７に示した従来技術においては、高熱伝導性部材３が加熱ローラ１の表面に接触しているので、加熱ローラ１の表面が劣化しやすく、また、装置が大型化するという難点があったが、この実施の形態の定着装置によれば、高熱伝導性部材４０が、中空パイプ状の加熱ローラ１０の内部に設けられていて加熱ローラ１０の内周面１７と接触するので、加熱ローラ１０の表面が劣化せず、装置も大型化しないという効果が得られる。

（ｂ）高熱伝導部材４０がローラで構成されているので、高熱伝導性部材４０と加熱ローラ内周面１７との接触面積が広くなり、一層効率的に加熱ローラ１０の軸線方向における温度分布の均一化を図ることが可能となる。しかも、高熱伝導部材４０がローラで構成されているので、高熱伝導部材４０を例えば摺接部材で構成した場合に比べて加熱ローラ１０の回転負荷が増大しないという効果も得られる。さらに、この実施の形態では、図４に示したように、高熱伝導ローラ４０の表面（加熱ローラ１０の内周面１７との接触面）を、高熱伝導性の弾性層４１で被覆してあるので、加熱ローラ１０の内周面１７との接触が確実かつ円滑になると同時に接触面積もさらに増大し、より一層効率的に加熱ローラ１０の軸線方向における温度分布の均一化を図ることが可能となる。

（ｃ）高熱伝導部材４０が、加熱ローラ１０の回転方向に関し、加圧ローラ２０との圧接位置Ｎに対応する部位１８の下流近傍において加熱ローラ１０の内周面１７と接触するので、以下に説明するように、一層効率的に加熱ローラ１０の軸線方向における温度分布の均一化を図ることが可能となる。すなわち、この種の定着装置においては、加熱ローラ１０と加圧ローラ２０との圧接部Ｎを用紙Ｐが通過することで、両ローラ１０，２０における用紙Ｐとの接触部においては用紙（およびトナー）に熱が奪われ、非接触部においては用紙Ｐに熱が奪われないため、仮に何らの手段も講じないとしたならば、加熱ローラ１０の軸線方向における温度分布は、加熱ローラ１０の回転方向に関し、加圧ローラ２０との圧接位置Ｎに対応する部位１８の下流近傍において著しく不均一になりやすい。これに対し、この実施の形態の定着装置によれば、高熱伝導部材４０が、加熱ローラ１０の回転方向に関し、加圧ローラ２０との圧接位置Ｎに対応する部位１８の下流近傍、すなわち加熱ローラ１０の軸線方向における温度分布が著しく不均一になりやすく、温度差が大きくなりやすい位置において加熱ローラ１０の内周面１７と接触するので、加熱ローラ１０における高温部（用紙との非接触部に対応する部位）１０ａの熱が高熱伝導部材４０を介して低温部（用紙との接触部に対応する部位）１０ｂへ効率的に伝わることとなる。したがって、一層効率的に加熱ローラ１０の軸線方向における温度分布の均一化を図ることが可能となる。

（ｄ）ヒータ１５が、加熱ローラ１０の回転中心Ｏから偏倚しており、かつ、加熱ローラ１０の回転方向に関し、加圧ローラ２０との圧接位置Ｎに対応する部位１８の下流側すなわち上述したように加熱ローラ１０の軸線方向における用紙Ｐとの接触部位の温度が低くなる位置に配置されているので、その低温部に対するヒータ１５からの熱供給が効率的になされることとなる。したがって、一層効率的に加熱ローラ１０の軸線方向における温度分布の均一化を図ることが可能となる。しかも上述したように、高熱伝導部材４０が、加熱ローラ１０の回転方向に関し、加圧ローラ２０との圧接位置Ｎに対応する部位１８の下流近傍において加熱ローラ１０の内周面１７と接触するので、より一層効率的に加熱ローラ１０の軸線方向における温度分布の均一化を図ることが可能となる。

【００１８】＜第２の実施の形態＞図５は本発明に係る定着装置の第２の実施の形態の要部を示す概略断面図（図２におけるＩＩＩ－ＩＩＩ端面に相当する図）である。図５において、上記第１の実施の形態と同一部分ないし相当する部分には同一の符号を付してある。この実施の形態が上記第１の実施の形態と異なる点は、高熱伝導部材４０が、加熱ローラ１０の回転方向に関し、加圧ローラ２０との圧接位置Ｎに対応する部位１８の上流近傍において加熱ローラ１０の内周面１７と接触している点にあり、その他の点に変わりはない。この実施の形態によっても第１の実施の形態による上記（ａ）（ｂ）（ｄ）と同様な効果が得られる。また、高熱伝導部材４０が、加熱ローラ１０の回転方向に関し、加圧ローラ２０との圧接位置Ｎに対応する部位１８の上流近傍において加熱ローラ１０の内周面１７と接触しているので、加熱ローラ１０が用紙Ｐと接触する直前において、その軸線方向における温度分布の均一化が図られることとなり、結果として、安定した定着状態が得られることとなる。

【００１９】＜第３の実施の形態＞図６は本発明に係る定着装置の第３の実施の形態の要部を示す概略断面図（図２におけるＩＩＩ－ＩＩＩ端面に相当する図）である。図６において、上記第１の実施の形態と同一部分ないし相当する部分には同一の符号を付してある。この実施の形態が上記第１の実施の形態と異なる点は、高熱伝導部材が、２つ（４０、４０’）設けられていて、その１つの高熱伝導部材４０が、加熱ローラ１０の回転方向に関し、加圧ローラ２０との圧接位置Ｎに対応する部位１８の下流近傍において加熱ローラ１０の内周面１７と接触し、他の１つの高熱伝導部材４０’が、前記部位１８の上流近傍において加熱ローラ１０の内周面１７と接触する点にあり、その他の点に変わりはない。この実施の形態によれば、上記第１，第２の実施の形態による作用効果が同時に得られることとなる。

【００２０】以上、本発明の実施の形態について説明したが、本発明は上記の実施の形態に限定されるものではなく、本発明の要旨の範囲内において適宜変形実施可能である。例えば、

①請求項２以外の発明については、高熱伝導ローラ４０は、ローラではなく、加熱ローラ１０の内周面１７に摺接する部材で構成してもよい。

②高熱伝導部材４０に対して接離機構を設け、温度分布が特に不均一になりやすい小サイズ紙（上記通紙領域Ｐ（幅）の小さな用紙）に定着させる場合にのみ、高熱伝導部材４０を加熱ローラ１０の内周面１７に当接させ、それ以外（使用頻度の高い大サイズ紙（例えばＡ４サイズ紙））の場合には、当接させないことによって、使用頻度の高い用紙に定着させるの場合におけるウォームアップ時間を著しく短縮することができる。

③高熱伝導部材４０は２個以上設けてもよい。

【００２１】

【発明の効果】請求項１～６記載のいずれの定着装置によっても、発熱体部分の構造が（したがって制御も）簡単でウォームアップ時間も短くて済み、効率的に加熱ローラの軸線方向における温度分布の均一化を図ることができるという効果が得られる。しかも、加熱ローラの表面が劣化せず、装置も大型化しないという効果も得られる。さらに、請求項２記載の定着装置によれば、一層効率的に加熱ローラの軸線方向における温度分布の均一化を図ることが可能となると同時に、加熱ローラの回転負荷が増大しないという効果が得られる。請求項３記載の定着装置によれば、一層効率的に加熱ローラの軸線方向における温度分布の均一化を図ることが可能となる。請求項４記載の定着装置によれば、安定した定着状態が得られることとなる。請求項５記載の定着装置によれば、より一層安定した定着状態が得られることとなる。請求項６記載の定着装置によれば、より一層効率的に加熱ローラの軸線方向における温度分布の均一化を図ることが可能となる。

【００２２】

【図面の簡単な説明】

【図１】本発明に係る定着装置の第１の実施の形態の要部を示す概略正面図。

【図２】同上正断面図。

【図３】図２における部分省略ＩＩＩ－ＩＩＩ端面図。

【図４】加熱ローラの拡大断面図。

【図５】本発明に係る定着装置の第２の実施の形態の要部を示す概略断面図（図２におけるＩＩＩ－ＩＩＩ端面に相当する図）。

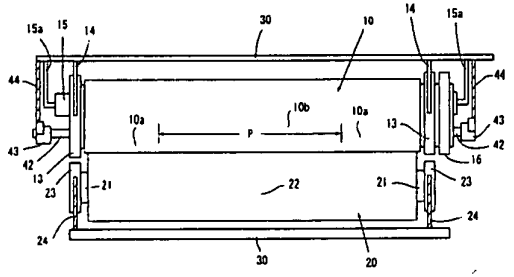
【図６】本発明に係る定着装置の第３の実施の形態の要部を示す概略断面図（図２におけるＩＩＩ－ＩＩＩ端面に相当する図）。

【図７】従来技術の説明図。

【符号の説明】

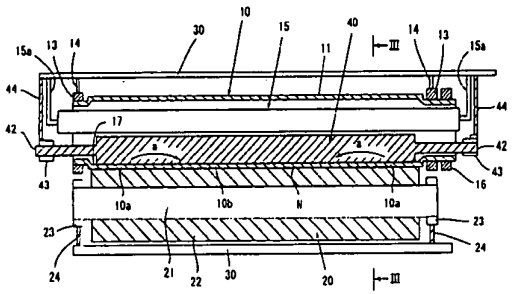
１０　加熱ローラ
１５　ヒータ
１７　内周面
２０　加圧ローラ
４０　高熱伝導ローラ（高熱伝導部材）
Ｎ　圧接位置

【図１】



82857-01

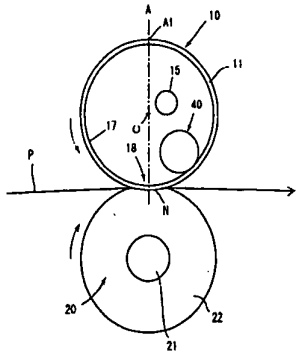
【図２】



82857-02

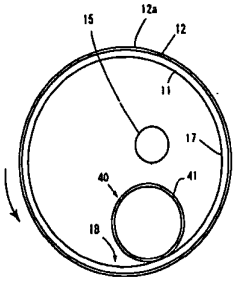
【図３】

82857-03



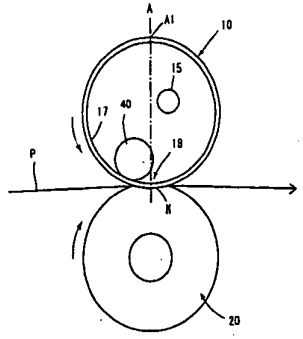
【図４】

82857-04



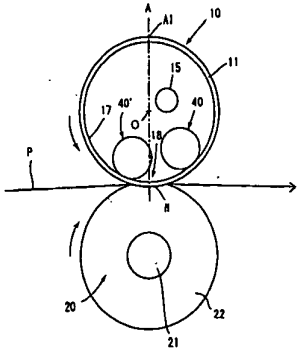
【図５】

82857-05



【図６】

82857-06



[図７]

82857-07